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# **Motor Vehicle Crashes in Indiana 2003-2005**

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**A Report on Motor Vehicle Crash Deaths and Injuries**



Indiana State  
Department of Health

Judith A. Monroe, MD  
State Health Commissioner

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Injury Prevention Program  
January 2008

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2003-2005  
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**State Health Commissioner  
Judith A. Monroe, MD**

**Human Health Services Commission  
Loren Robertson, MS, Assistant Commissioner**

**Primary Authors**

**Jodi Hackworth, MPH, Epidemiologist, Injury Prevention Program  
Joan Marciniak, MPH, Epidemiologist, Injury Prevention Program  
Charlene Graves, MD, Medical Director, Injury Prevention Program**

**Other Contributors**

**Linda W. Stemnock, BSPH, Data Analyst / BRFSS Coordinator  
Robert Teclaw, DVM, PhD, MPH, State Epidemiologist**

**Indiana State Department of Health  
2 North Meridian Street  
Indianapolis, IN 46204  
[www.in.gov/isdh](http://www.in.gov/isdh)**

Dear Colleagues,

The Indiana State Department of Health is pleased to provide this data report on the medical impact of motor vehicle crashes (MVCs) in Indiana. The Indiana Department of Transportation requested this medical analysis of motor vehicle crash injuries as part of its Strategic Highway Safety Plan.

It is well established that MVCs are the single largest contributor to the huge toll that injuries take on people living in Indiana and across the United States. The injury toll of MVCs is especially evident in our teenagers and young adults, but death rates from MVCs are also high in our elderly population. As with most types of injuries, males are affected by MVCs more often than females. This report also documents that MVCs are affecting the growing Hispanic population in Indiana, with an increasing death rate in Hispanic males.

Almost 10,000 Hoosiers were hospitalized due to MVCs from 2003 through 2005, comprising 10.5% of all hospital admissions. The hospital charges for those hospitalized totals \$270 million during that period of time. While occupants of motor vehicles account for most of these hospital admissions, motor vehicle collisions with bicyclists and pedestrians account for an additional 5.8%.

The medical costs documented in this report are an important factor reflecting the economic toll from MVCs in Indiana, but this cost cannot reflect the additional impact of lost productivity and the psychological and emotional impact on persons injured in MVCs, which also affects their families and friends.

Measures that can decrease the impact of MVC injuries have been studied. These evidence-based recommendations include the use of child safety restraints, safety belts, and avoidance of alcohol when driving. Laws and regulations promoting these safety measures and strict enforcement of such laws are of the utmost importance in trying to prevent injuries from MVCs. Strict graduated driver licensing programs and related laws are needed to lessen MVC injuries in the adolescent population. These are some of the preventive measures important in traffic safety programming and needed to improve public health in Indiana.

We hope that the information contained in this report will be used to develop strategies and programs that decrease the impact of MVC injuries and protect Hoosiers.

Sincerely,

Charlene Graves, MD  
Medical Director, Injury Prevention Program

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## **Highlights**

### **Mortality, 2003-2005**<sup>(2)</sup>

- Motor vehicle crashes (MVCs) were the 9<sup>th</sup> leading cause of death for Indiana residents, claiming 2,881 lives.
- Males were 2.5 times more likely to die in a MVC than females (22.1 per 100,000 vs. 8.9 per 100,000).
- During 2004 and 2005, white males had the highest rate of death due to MVCs (23.3 per 100,000 and 23.3 per 100,000) than all other race/gender categories.
- Young adults (20-24 year olds) had the highest age-adjusted MVC death rate (29.7 per 100,000) of all ages.

### **Inpatient Admissions for Motor Vehicle Crashes, 2003-2005**<sup>(3)</sup>

- MVCs accounted for approximately 10.5% (9,859 admissions) of all hospital inpatient admissions.
- Males were 1.6 times more likely to be admitted to the hospital following a MVC than females (64.4 per 100,000 compared to 40.8 per 100,000).
- Blacks were admitted to the hospital due to MVCs more than whites (55.0 per 100,000 versus 47.3 per 100,000).
- The age group with the highest hospital admission rate due to MVCs was 15-19 year olds.

### **Outpatient/Emergency Department (ED) Visits for Motor Vehicle Crashes, 2003-2005**<sup>(3)</sup>

- MVCs accounted for approximately 7.3% (106,849 visits) of all hospital outpatient/ED visits.
- Females were less likely (0.89 times) to be seen in an outpatient/ED facility following a MVC than males (537.5 per 100,000 compared to 605.5 per 100,000).
- Blacks were more likely to visit the outpatient/ED than whites (792.8 per 100,000 versus 488.5 per 100,000).
- Those 15-19 years of age had the highest rate of outpatient/ED visits due to MVCs compared to all other age groups.

### **Adolescents and Risk Behavior**<sup>(7)</sup>

- In 2007, 11.9% of high school students reported driving one or more times in the previous 30 days while they were under the influence of alcohol.
- 9.2% of high school students (2007), 8.2% (2005), and 10.6% (2003) reported that they never or rarely wore a seat belt when riding in a car driven by someone else.

## **Introduction**

Motor vehicle crash (MVC) injuries kill more children and young adults than any other single cause in the United States. They are the leading cause of unintentional injury for individuals one to 64 years of age and cause a heavy burden on society in terms of deaths, life-long disability, and economic costs. Each year in the United States, more than 41,000 people die in MVCs and about 500,000 hospitalizations and four million emergency department (ED) visits occur due to MVC injuries.<sup>(1)</sup>

A new study reports that patients 20 years and younger accounted for more than 62,000 hospitalizations and more than 304,000 days of hospitalization in the United States during a one-year study period. When compared to all other injury types, children and adolescents sustain more extensive and severe injuries. According to the Centers for Disease Control (CDC), the economic burden of MVC deaths and injuries is enormous, costing the United States more than \$150 billion each year.<sup>(1)</sup>

### **Motor Vehicle Crash Deaths in Indiana**

The MVC death data for this report was extracted from the Indiana State Department of Health (ISDH) mortality data. The numbers differ slightly from the nationally-based reporting system, the National Center for Health Statistics (NCHS). The number of Indiana deaths reported by ISDH is lower than the numbers from NCHS, because ISDH does not always receive death certificates for Indiana residents that died out of state. However, these deaths are likely to be reported to NCHS from state health departments, and NCHS would usually be able to assign state of residence, making the nationally-based data more complete than ISDH data. In addition, completeness of mortality data is dependent upon how thoroughly the death certificate was completed, which affects how a death was categorized. Another limitation is that race/ethnicity data may not be very accurate. Race/ethnicity information is provided at the discretion of the person completing the death certificate and may not reflect how individuals would define their own race or ethnicity.<sup>(2)</sup>

Between 2003 and 2005, MVCs were the 9<sup>th</sup> leading cause of death for Indiana residents, claiming 2,881 lives with an age-adjusted rate of 15.2 deaths per 100,000 population. The average rate is a slight decrease from 999 deaths (16.0 per 100,000) in 2004 but was an increase from 2003 (922 deaths, 14.8 per 100,000).<sup>(2)</sup>

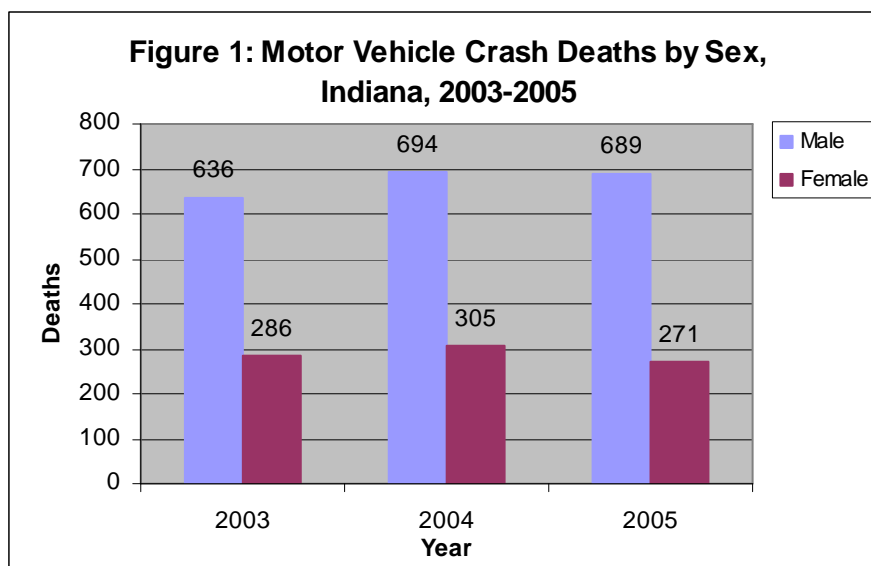
Males died more often than females as a result of a MVC. For males, MVCs were the 6<sup>th</sup> leading cause of death and 11<sup>th</sup> for females. Between 2003 and 2005, 2,019 males and 862 females died in MVCs (Figure 1). Between 2003-2005, males were 2.5 times more likely to die in a MVC than females (22.1 per 100,000 vs. 8.9 per 100,000). Figure 2 shows the death rates for males and females broken out by individual year.<sup>(2)</sup>

MVCs were the 3<sup>rd</sup> leading cause of death for Hispanics/Latinos, 9<sup>th</sup> for whites, and 13<sup>th</sup> for blacks. During 2003-2005, MVCs claimed the lives of 2,649 whites (15.8 per 100,000), 195 blacks (12.2 per 100,000), and 114 Hispanics/Latinos (13.0 per 100,000). Figure 3 depicts the number of deaths per year by race/ethnicity and Figure 4 shows the rates. Rates have remained

relatively the same for whites and blacks during those years. However, the age-adjusted rate of MVCs for Hispanics/Latinos decreased between 2003 and 2004.<sup>(2)</sup>

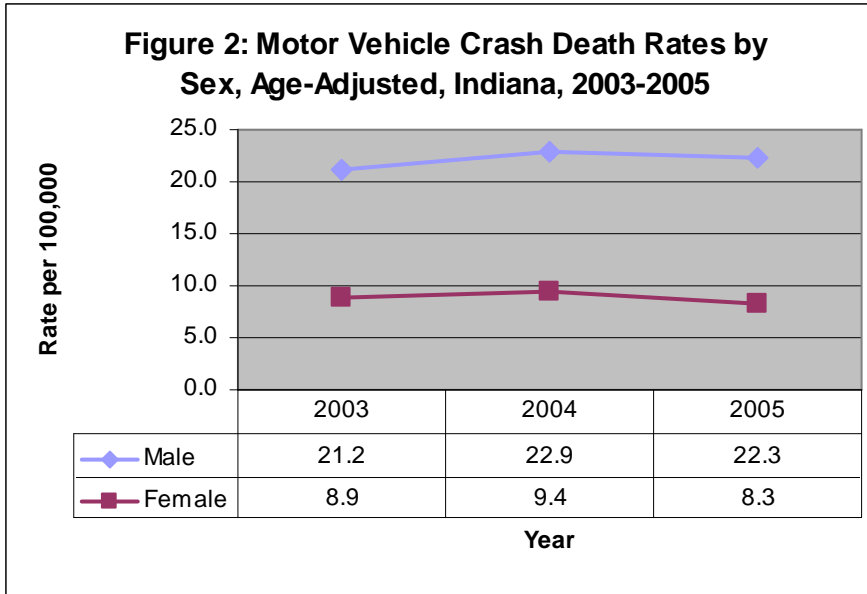
Hispanic males had the highest rate in 2003 (22.3 per 100,000), and white males had the highest rates of death in 2004 and 2005 (23.3 per 100,000 and 22.9 per 100,000). Black females had the lowest death rate all three years. The rates for Hispanic/Latino females were unstable due to the low number of deaths. Figures 5 and 6 show the number of deaths and the death rates for each race/ethnicity and sex category.<sup>(2)</sup>

Young adults are at greatest risk for MVC deaths (Figure 7). Between 2003 and 2005, 20-24 year olds had the highest age-specific death rate of 29.7 per 100,000 (Figure 8). The 15-19 year olds and 85+ year olds also had high age-specific death rates at 26.2 per 100,000 and 25.4 per 100,000. The lowest rates of death due to MVC's were in children less than 14 years of age. Figure 9 shows the number of deaths for each age group by year, and Figure 10 shows the age-specific death rate by age group and year. The highest age-specific rate of death among all age groups occurred in 2004 in 20-24 year olds with an age-adjusted rate of 30.9 per 100,000.<sup>(2)</sup>

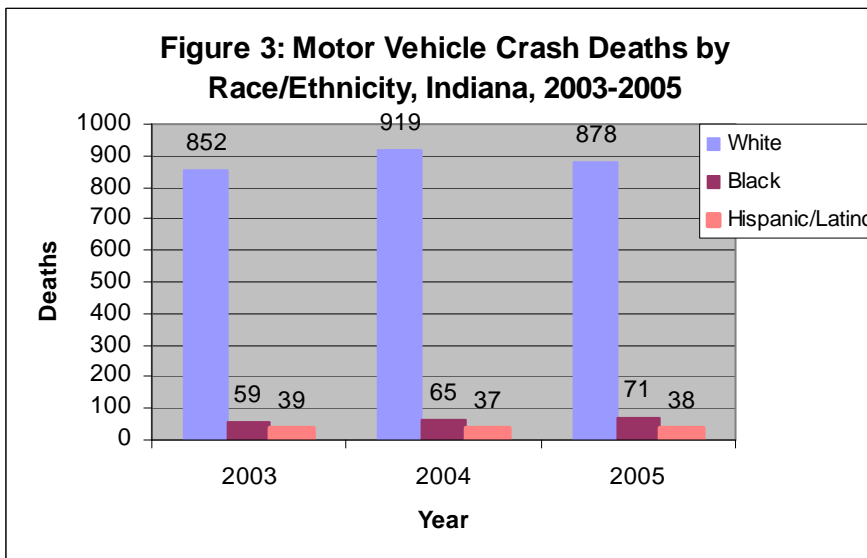


Source: Indiana State Department of Health, Mortality Data, 2003-2005



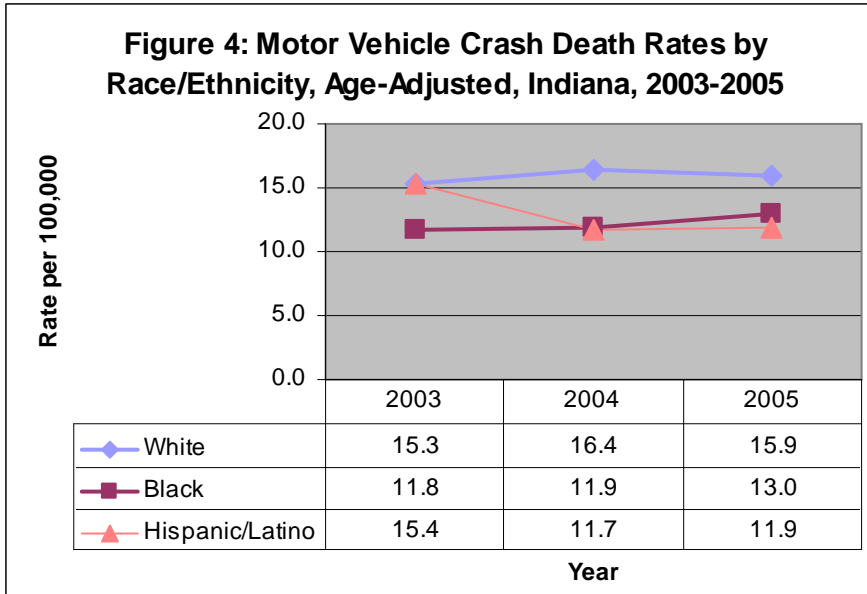


Source: Indiana State Department of Health, Mortality Data, 2003-2005



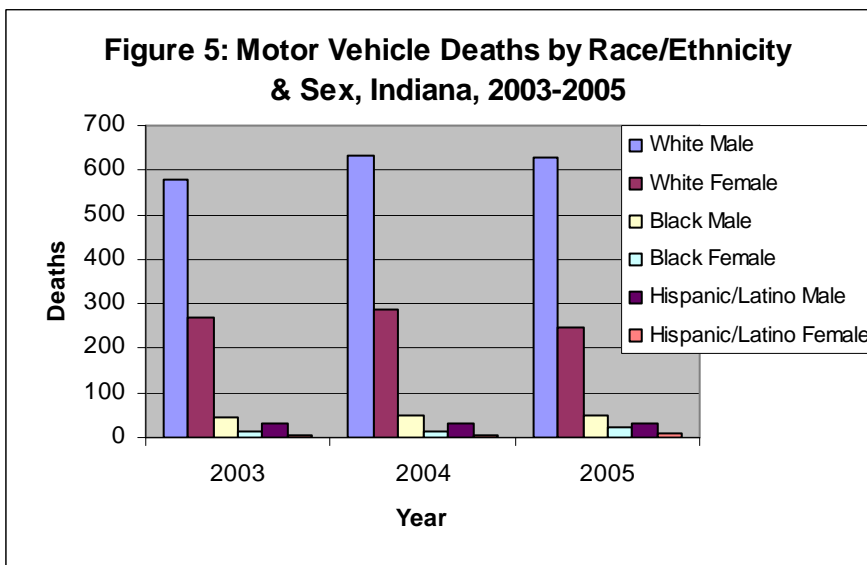
Note: Whites and blacks are both non-Hispanic.

Source: Indiana State Department of Health, Mortality Data, 2003-2005



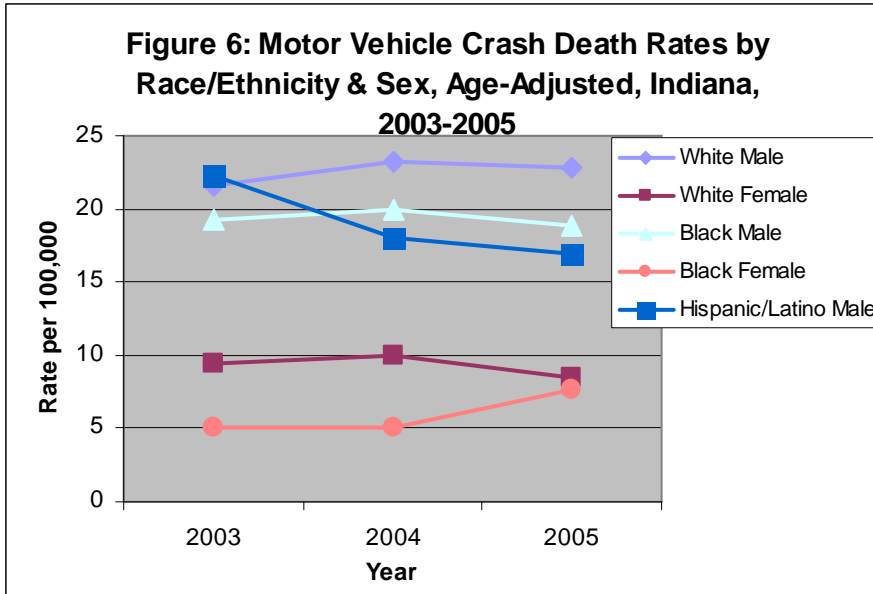
Note: Whites and blacks are both non-Hispanic.

Source: Indiana State Department of Health, Mortality Data, 2003-2005



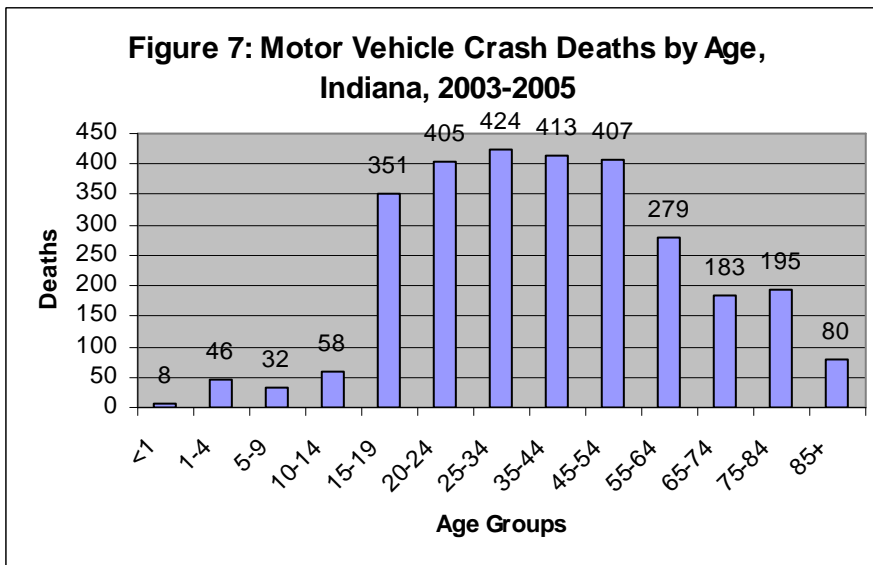
Note: Whites and blacks are both non-Hispanic.

Source: Indiana State Department of Health, Mortality Data, 2003-2005

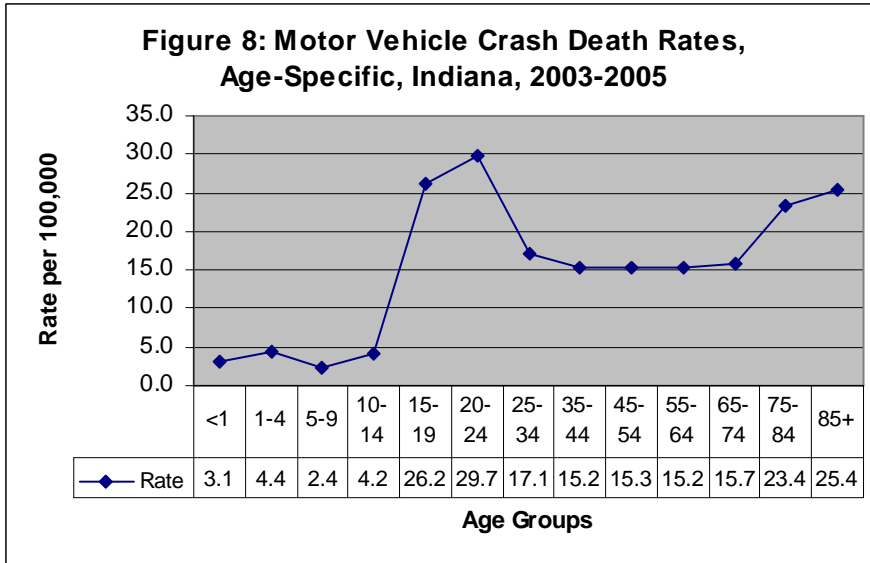


Note: Whites and blacks are both non-Hispanic.

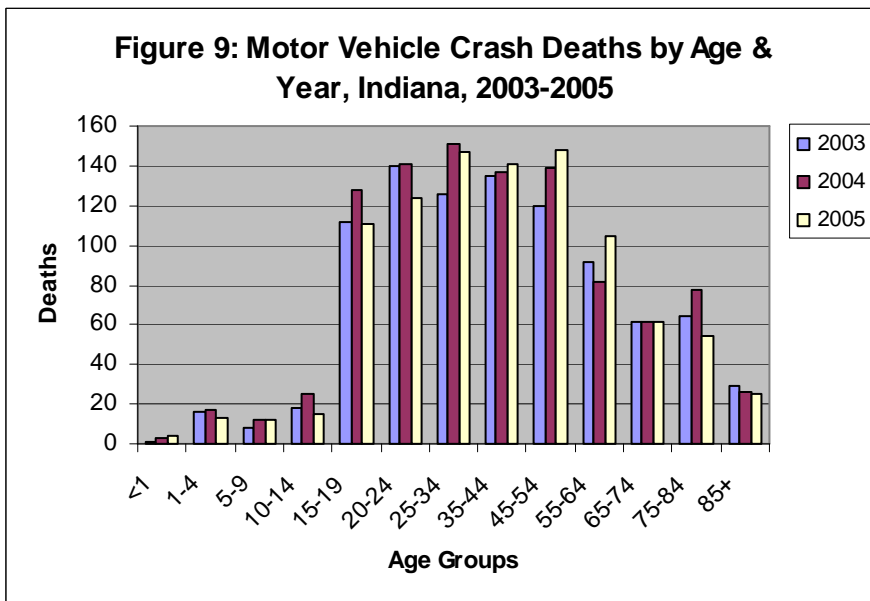
Source: Indiana State Department of Health, Mortality Data, 2003-2005



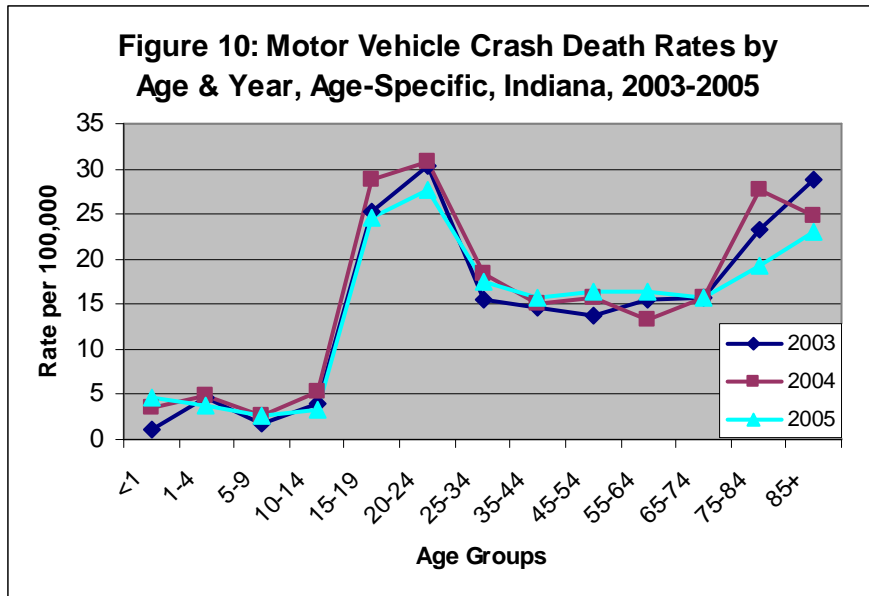
Source: Indiana State Department of Health, Mortality Data, 2003-2005



Source: Indiana State Department of Health, Mortality Data, 2003-2005



Source: Indiana State Department of Health, Mortality Data, 2003-2005



Source: Indiana State Department of Health, Mortality Data, 2003-2005

### Motor Vehicle Injuries in the Indiana

Hospital discharge data give an indication of the number of MVC injuries in Indiana although the data have limitations. The International Classification of Disease Revision 9 Clinical Modification (ICD-9CM) coding scheme includes external causes of injury codes or E-codes that indicate the source or cause of the injury and can also provide injury-related cost data. However, E-codes are not mandated by law in Indiana, and it is estimated that only 55% of the discharge records contain them. Therefore, the total number of MVC injuries in this report is a gross underestimation of the proportion of actual MVC injuries.<sup>(3)</sup>

E-codes specific to MVCs include E810-819, 958.5, 968.5, and 988.5. The hospital database does not contain a patient-specific unique identifier meaning that it does not distinguish whether one person had five visits or whether five people visited once. Therefore, statistics only reflect visits and not specific numbers of people. Also race/ethnicity data are not very accurate, because race/ethnicity classification is at the discretion of the person reporting the data and may not reflect how the individuals would define themselves. In some cases information is not provided at all.<sup>(3)</sup>

A final limitation of the hospital discharge data is that Indiana law only requires hospital discharge data submission by acute care hospitals. Therefore, a few psychiatric and behavioral health hospitals do not submit data. All acute care hospitals are submitting inpatient data. However, one of the three Level 1 Trauma center hospitals has not submitted outpatient/ED data yet. As a result, the total number of MVC incidents for the outpatient/ED data is an underestimation of the actual number of MVCs and should be used with caution.<sup>(3)</sup>

## Hospital Inpatient Data

From 2003 to 2005, there were 94,266 inpatient hospitalizations with a primary diagnosis of injury or poisoning. Based on the data with valid E-codes, MVCs accounted for approximately 10.5% (9,859 admissions) of all injury/poisoning hospital inpatient admissions. Of those admitted to the hospital 60.4% (5,950) were male and 39.6% (3,908) were female (one person's gender was unknown). When comparing rates, males were 1.6 times more likely to be admitted to the hospital due to a MVC than females (64.4 per 100,000 compared to 40.7 per 100,000).<sup>(3)</sup>

The majority (79.8%, 7,873/9,859) of the hospital admissions were white Indiana residents (Figure 11). However, the age-adjusted rate for hospital admissions was higher in blacks compared to whites (55.0 per 100,000 versus 47.3 per 100,000). White males accounted for 60.0% (4,727/7,873) of all hospital admissions by white Indiana residents (Figure 12). However, black males had a higher age-adjusted rate (70.7 per 100,000) compared to white males (57.5 per 100,000). Black females also had a higher age-adjusted rate of hospital admission when compared to white females (40.8 per 100,000 and 36.8 per 100,000).<sup>(3)</sup>

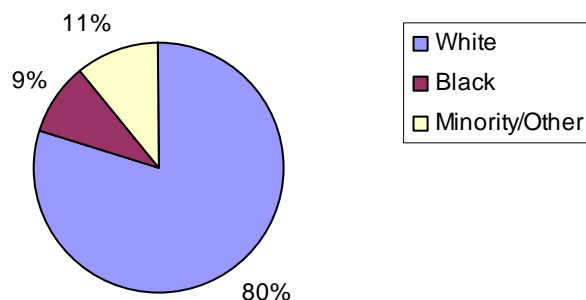
During 2003-2005, 15-19 year olds had the highest age-specific rate of hospital admissions due to MVCs (102.2 per 100,000). The lowest age-specific rate of hospital admissions due to MVCs was for those less than one year of age (4.3 per 100,000). Figure 13 shows the actual number of hospital admissions for each age group while Figure 14 shows the age-specific rate for each age group.<sup>(3)</sup>

Most MVCs are unintentional, however there were 23 hospitalizations during 2003-2005 in which the E-code was either a suicide or self-inflicted poisoning by motor vehicle exhaust gas, a suicide or self-inflicted injury by crashing a motor vehicle, or poisoning by motor vehicle exhaust gas either accidentally or purposely. Of all unintentional MVCs, occupants of motor vehicle accounted for 71.8% (7,064/9,836) of all hospital admissions. Figure 15 displays the number of hospital admissions by age group for motor vehicle occupants. Other unintentional MVCs included MVCs involving collisions with other types of vehicles (train, bus, etc) 14.5% (1,426/9,836), MVCs involving bicycles 2.2% (221/9,836), and MVCs involving pedestrians 3.6% (358/9,836).<sup>(3)</sup>

Between 2003 and 2005, 3.1% (303/9,859) of all patients admitted to the hospital due to a MVC died. The majority (75.9%) of all patients were admitted to the hospital as an emergency (Figure 16), and 77.0% were admitted after receiving care at an outpatient center or in the ED (Figure 17).<sup>(3)</sup>

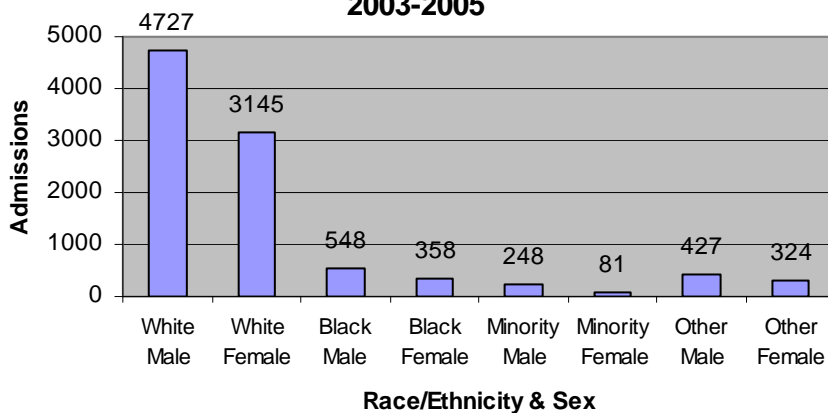
For 2003-2005, the total charges for all ages injured due to MVCs and admitted to the hospital were \$270 million. The mean and median total charges for all ages due to MVCs were \$27,439 and \$17,796.00 with a range of \$566.00–\$591,543. Fifty percent (4,884/9,859) of those admitted to the hospital had commercial insurance (Figure 18). The average length of stay was five days (range 1-114 days), and the median length of stay was three days.<sup>(3)</sup>

**Figure 11: Motor Vehicle Crash Inpatient Hospital Admissions by Race, Indiana, 2003-2005**



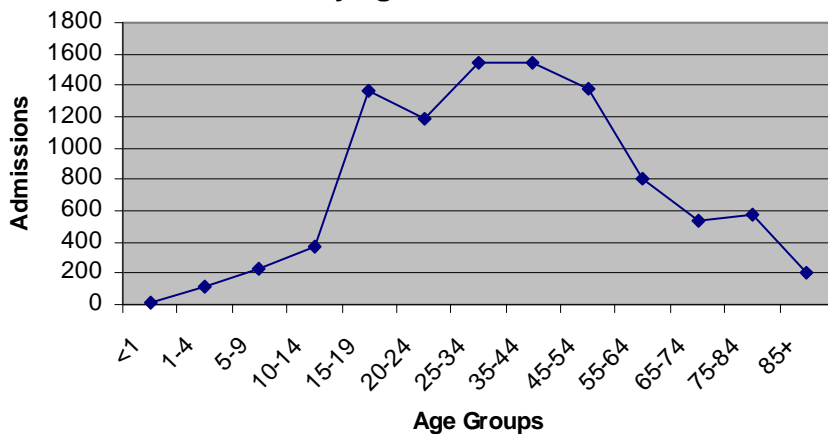
Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

**Figure 12: Motor Vehicle Crash Inpatient Hospital Admissions by Race/Ethnicity & Sex, Indiana, 2003-2005**



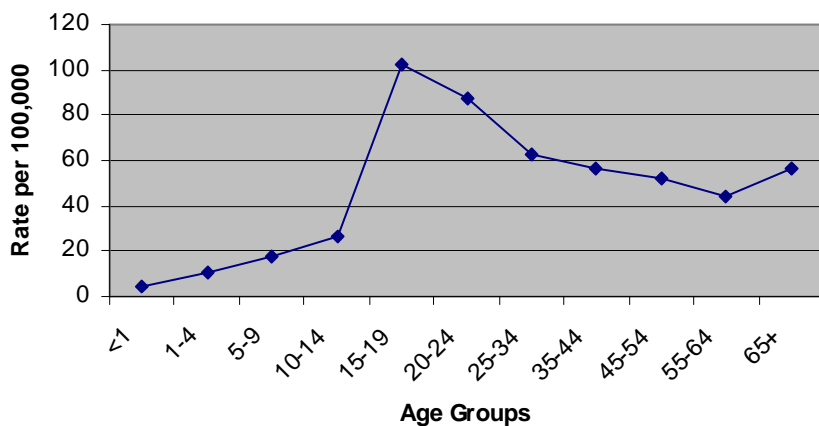
Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

**Figure 13: Motor Vehicle Crash Inpatient Hospital Admissions by Age, Indiana, 2003-2005**



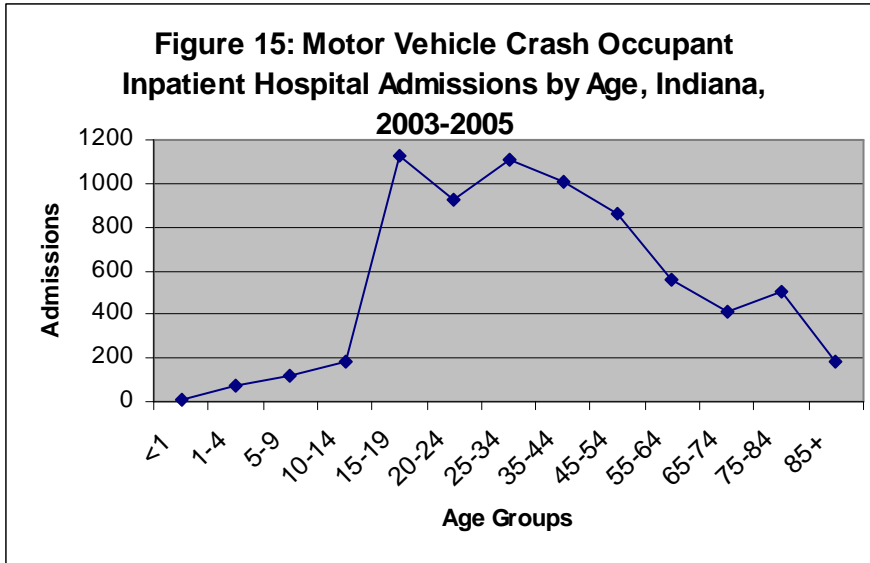
Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

**Figure 14: Motor Vehicle Crash Inpatient Hospital Admission Rates, Age-Specific, Indiana, 2003-2005**

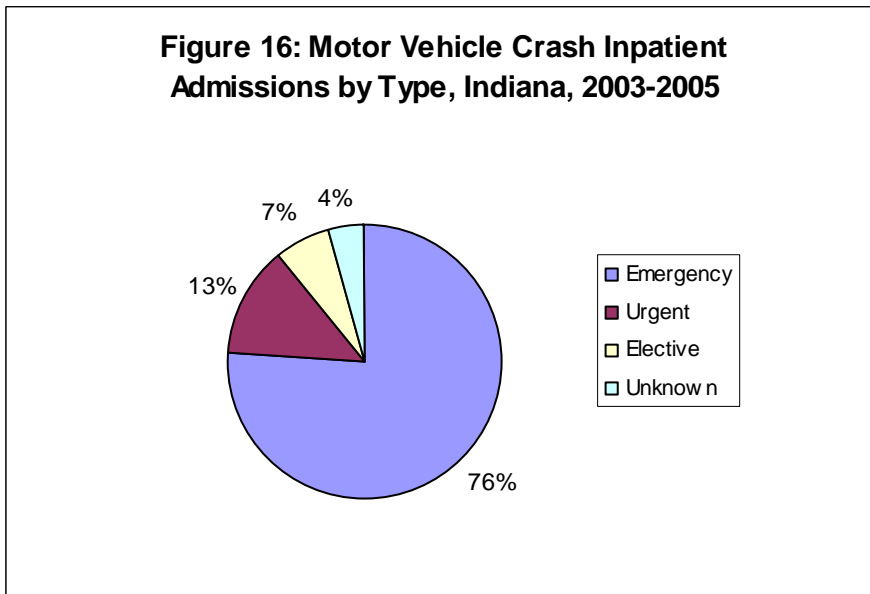


Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005



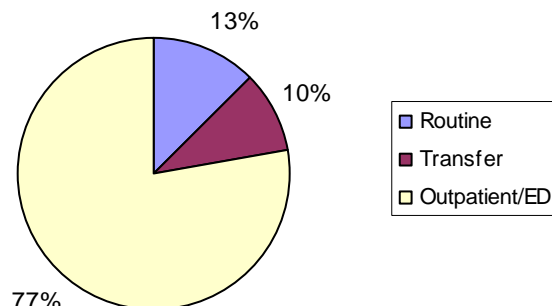


Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005



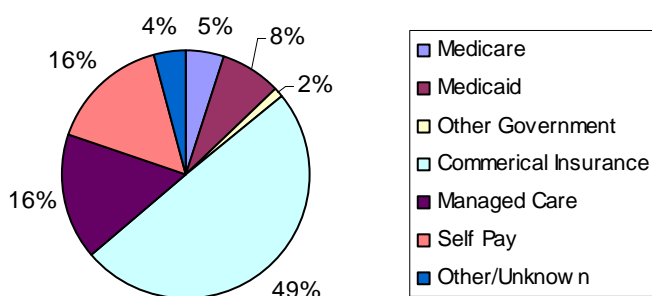
Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

**Figure 17: Motor Vehicle Crash Inpatient Admissions by Source, Indiana, 2003-2005**



Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

**Figure 18: Motor Vehicle Crash Inpatient Hospital Admissions by Payor, Indiana, 2003-2005**



Source: Indiana State Department of Health, Injury Prevention Program, Inpatient Hospital Discharge Data, 2003-2005

### **Hospital Outpatient/Emergency Department Data**

During 2003 and 2005, there were 1,466,623 outpatient/emergency department (ED) visits with a primary diagnosis for injury or poisoning (ICD-9CM codes 800-999). Based on the data with valid E-codes, MVCs accounted for approximately 7.3% (106,849 visits) of injury/poisoning outpatient/ED visits. Of those receiving treatment at an outpatient/ED facility, 47.0% (50,220/106,849) were male and 53.0% (56,626/106,849) were female (three people's gender

was unknown). When comparing rates, females were less likely (0.89 times) to be seen at an outpatient/ED facility due to a MVC than males (537.5 per 100,000 compared to 605.5 per 100,000).<sup>(3)</sup>

The majority (75.5%, 80,650/106,846) of the visits to the outpatient/ED were white Indiana residents (Figure 19). However, the age-adjusted rate for visits to the outpatient/ED was higher in blacks compared to whites (792.8 per 100,000 versus 488.5 per 100,000). White females accounted for 52.8% (42,593/80,649) of all visits to the outpatient/ED by white Indiana residents (Figure 20). However, black females had a higher age-adjusted rate (842.5 per 100,000) compared to white females (517.5 per 100,000), and black males had a higher age-adjusted rate (739.4 per 100,000) compared to white males (460.3 per 100,000).<sup>(3)</sup>

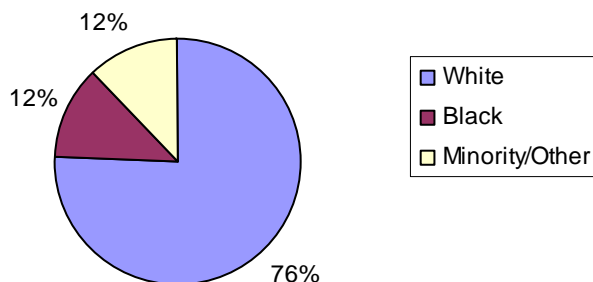
Between 2003 and 2005, the age group with the highest age-specific rate for outpatient/ED visits due to MVCs was those 15-19 years of age (1,431.2 per 100,000). The lowest age-specific rate of visits due to MVC's was in those less than one year of age (84.1 per 100,000). Figure 21 shows the actual number of outpatient/ED visits for each age group while Figure 22 shows the age-specific rate for each age group. Female ages 15-19 and 25-34 had the highest numbers of visits to the outpatient/ED (Figure 23).<sup>(3)</sup>

Most MVCs are unintentional, however there were 71 visits to the outpatient/ED during 2003-2005 in which the E-code was either a suicide or self-inflicted poisoning by motor vehicle exhaust gas, a suicide or self-inflicted injury by crashing a motor vehicle, or poisoning by motor vehicle exhaust gas either accidentally or purposely. Of all unintentional MVCs, the occupants of motor vehicles accounted for 82.5% (88,177/106,778) of all outpatient/ED visits. Figure 24 displays the number of visits by age group for motor vehicle occupants. Other unintentional MVCs included MVCs involving collisions with other types of vehicles (5,658/106,778), MVCs involving bicycles (1,333/106,778), and MVCs involving pedestrians (3,022/106,778).<sup>(3)</sup>

When discharge status was known during 2003-2005, 0.1% (100/98,076) of patients seen at an outpatient/ED facility died as a result of a MVC.<sup>(3)</sup>

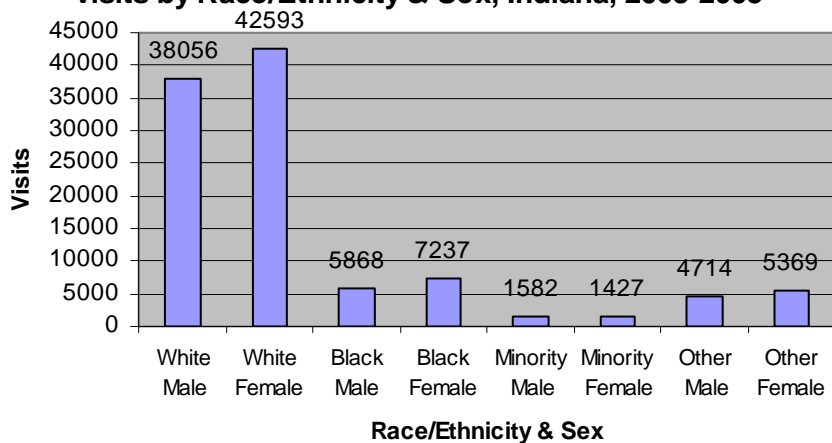
For 2003-2005, the total charges for all ages injured due to MVC and seen in an outpatient/ED facility were \$142 million. The mean and median total charges for all ages due to MVC were \$1,337.73 and \$684.00 (\$0-\$95,524). The majority of the patients had commercial insurance (51.9%, 55,453/106,849) (Figure 25).<sup>(3)</sup>

**Figure 19: Motor Vehicle Crash Outpatient/ED Visits by Race/Ethnicity, Indiana, 2003-2005**

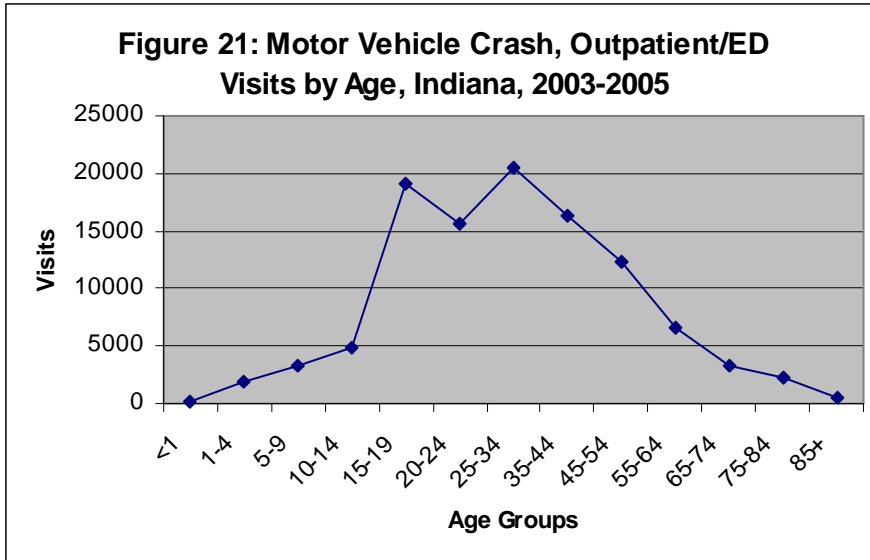


Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

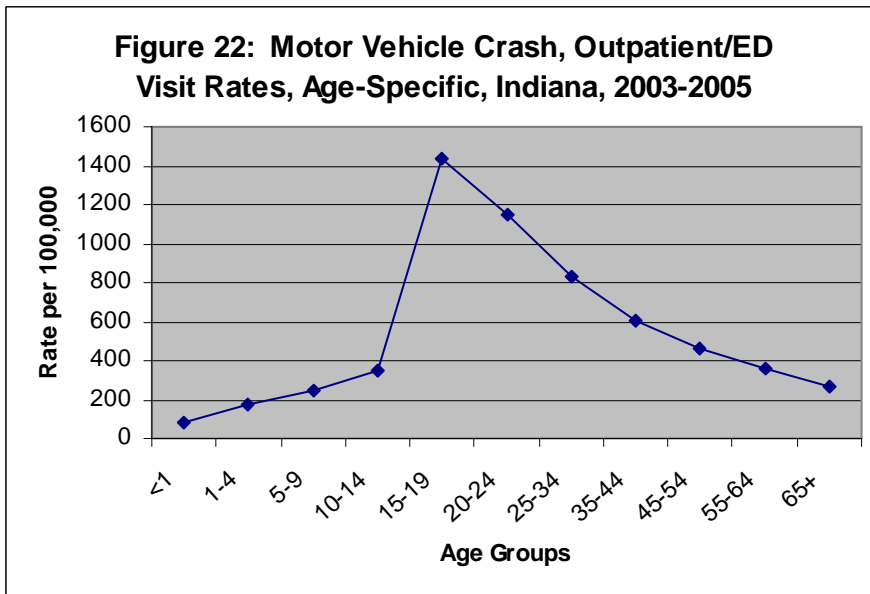
**Figure 20: Motor Vehicle Crash Outpatient/ED Visits by Race/Ethnicity & Sex, Indiana, 2003-2005**



Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

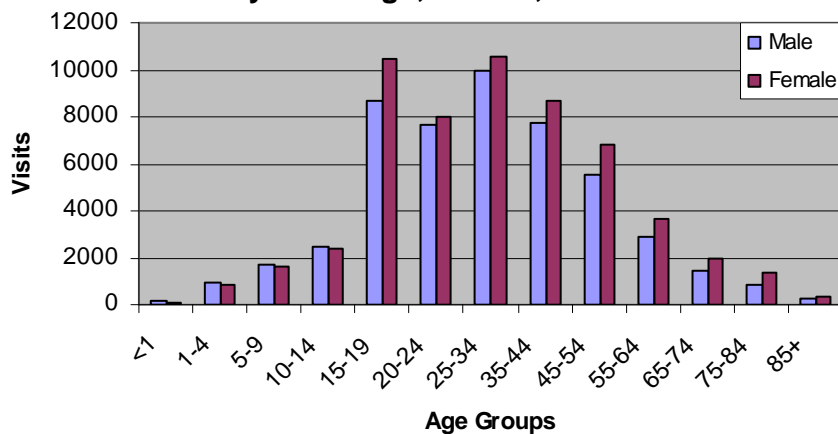


Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005



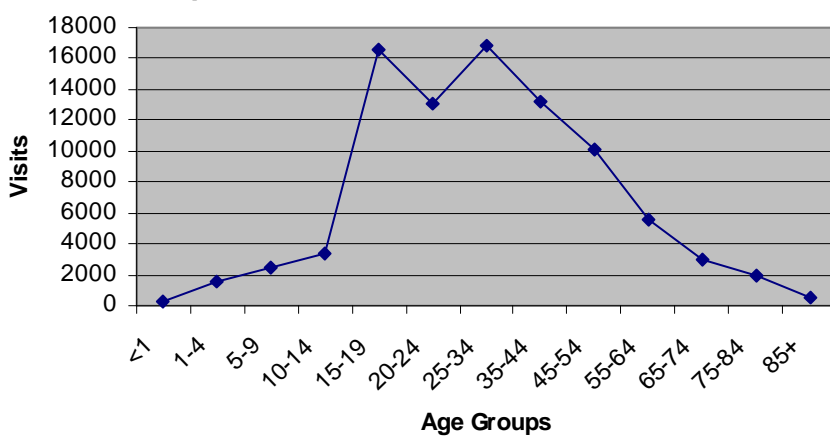
Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

**Figure 23: Motor Vehicle Crash, Outpatient/ED Visits by Sex & Age, Indiana, 2003-2005**



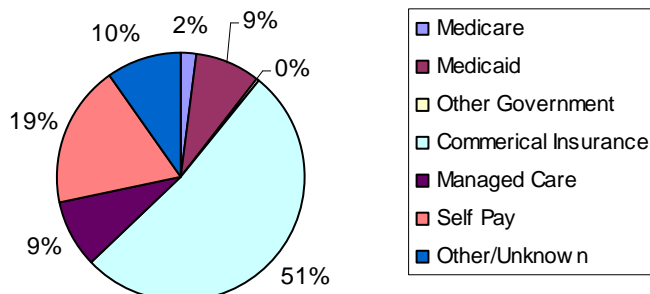
Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

**Figure 24: Motor Vehicle Crash Occupant Outpatient/ED Visits, Indiana, 2003-2005**



Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

**Figure 25: Motor Vehicle Crash Outpatient/ED Visits by Payor, Indiana, 2003-2005**



Source: Indiana State Department of Health, Injury Prevention Program, Outpatient/Emergency Department Hospital Discharge Data, 2003-2005

### Risk Behaviors and Prevention

MVC injuries and fatalities are tragic and unnecessary because they are preventable. The Guide to Community Prevention Services recommends focusing on prevention efforts related to alcohol use, safety belt use, and proper use of child safety seats to reduce the burden of MVCs. These areas were chosen because nationally 41% of MVC deaths are alcohol related, 55% of deaths are among occupants who were unrestrained by seat belts or child safety seats, and belt use among drivers is below the national goals.<sup>(4)</sup>

#### Alcohol

Driving while under the influence of alcohol greatly increases the likelihood of an accident. According to National Highway Traffic Safety Association (NHTSA), a MVC is considered to be alcohol-related if at least one driver or non-occupant (such as a pedestrian or bicyclist) involved in the crash is determined to have had a blood alcohol concentration (BAC) of 0.01 gram per deciliter (g/dL) or higher. Thus, any fatality that occurs in an alcohol-related crash is considered an alcohol-related fatality.<sup>(5)</sup> According to the Indiana Criminal Justice Institute, Indiana's legal BAC is 0.08%. Indiana law changed the legal BAC from 0.10 to 0.08 % on July 1, 2001.<sup>(6)</sup>

When comparing 2003 to 2005 for the number of alcohol-related fatalities where at least one person had a BAC greater than 0.08 in Indiana, the percentage of fatalities increased from 27% of total fatalities to 29% (Table 1). During 2005, there were 320 Hoosier drivers who were involved in a fatal MVC who had any level of BAC, and 273 drivers had a BAC over 0.08%.<sup>(7)</sup>

Per mile driven, teen drivers ages 16-19 years (high school students) are four times more likely than older drivers to crash.<sup>(4)</sup> Even though drinking or possessing alcohol is illegal for persons

under 21, according to the 2007 Youth Behavior Risk Survey, 26.4% of high school students reported riding in a car with a driver under the influence of alcohol in the previous 30 days, which was an increase from 2005 (24.6%) (Figure 26). However, the change was not statistically significant. When comparing grade levels among the years, no pattern exists. During all three years, males were more likely to ride in a car with someone under the influence of alcohol than females. Between 2005 (27.1%) and 2007 (21.6%), a statistically significant decrease occurred among females who rode in a car with someone who had been drinking.<sup>(8)</sup>

In 2007, 11.9% of high school students reported driving one or more times in the previous 30 days while they were under the influence of alcohol, a slight increase from 2005 (11.2%) (Figure 27). However, the change was not statistically significant. Grade twelve had the highest percentage of driving while under the influence for all three years. Males were more likely (15.0% in 2007, 15.0% in 2005, and 14.1% in 2003) to drive while drinking than females (8.6% in 2007, 7.3% in 2005, and 10.8% in 2003).<sup>(8)</sup>

Prevention measures that are recommended by the Task Force on Community Preventative Services and have strong evidence supporting their effectiveness include: 0.08% BAC laws; minimum legal drinking age laws; sobriety checkpoints; and mass media campaigns to reduce alcohol-impaired driving.<sup>(4)</sup>

## **Seat Belts**

Seat belt use is the single most effective way to reduce fatal and nonfatal injuries in MVCs. Studies show that in all types of MVCs, lap-shoulder safety belts were about 45% effective in reducing deaths in passenger cars and 60% effective in light trucks. Safety belt use reduces the risk of serious injury to the head, chest, and extremities by 50-83%.<sup>(4)</sup> During 2003-2005, 30.6% (932/3,042) of all fatal crashes in Indiana occurred when the driver of a passenger car or light truck was not wearing a seat belt (Table 2). Out of 2,067 occupants who were killed while riding in a passenger car or light truck, 46.1% (952/2,067) were not wearing a seatbelt (Table 3).<sup>(7)</sup>

According to the Youth Behavior Risk Survey, 9.2% of high school students in 2007 and 8.2% in 2005 reported never or rarely wearing a seat belt (Figure 28). The change is not statistically significant. Students in twelfth grade wore their seat belts less than the other three grades for all three years. Males were more likely to not wear their seat belt (12.8% in 2007, 12.5% in 2005, and 15% in 2003) when compared to females (5.6% in 2007, 3.8% in 2005, and 6.1% in 2003).<sup>(8)</sup>

Children are particularly vulnerable to MVCs. The CDC reported that of the 459 children ages four years and younger who were killed in MVC in 2002, 40% were completely unrestrained. According to the Fatality Analysis Reporting System (FARS) data during 2003-2005 in Indiana, 20.5% (7/34) of motor vehicle occupants under the age of five who were involved in a fatal crash were not using a restraint of some nature.<sup>(7)</sup>

Prevention measures that are recommended by the Task Force on Community Preventative Services and have strong evidence supporting their effectiveness include: safety belt use laws; primary enforcement laws; and enhancement programs.<sup>(4)</sup>



## Child Safety Seats

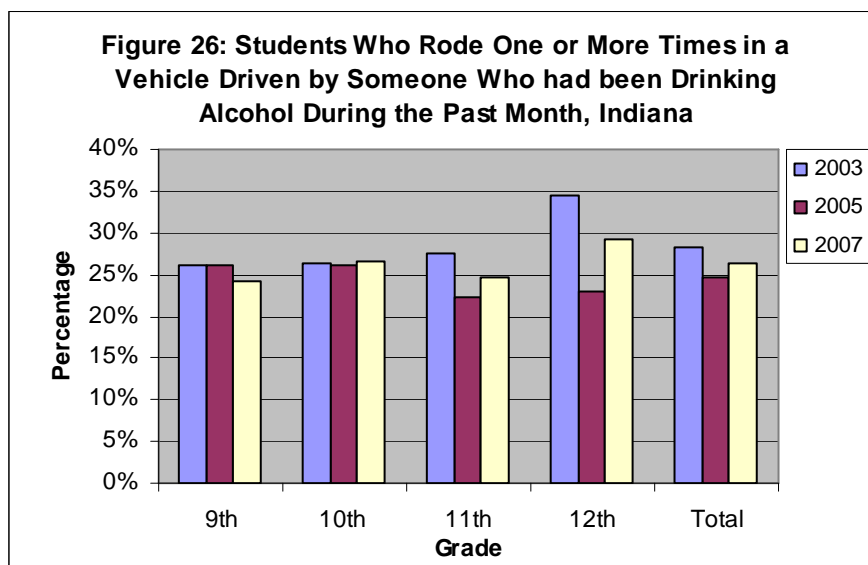
Nearly 30% of children under four years of age do not ride in a proper child restraint. Correctly installed safety seats reduce MVC hospitalization by 69% and deaths by 47-54% in children one to four years of age. Infant's risk of death is reduced by 70%. If all children up to age four rode in safety seat, 138 lives could be spared and 20,000 injuries prevented in the United States each year.<sup>(4)</sup> Unfortunately, state-level data on child safety seat use in Indiana are not available.

Prevention measures that are recommended by the Task Force on Community Preventative Services and have strong evidence supporting their effectiveness include: child safety seat use laws and distribution of safety seats coupled with education programs on how to effectively use them.<sup>(4)</sup>

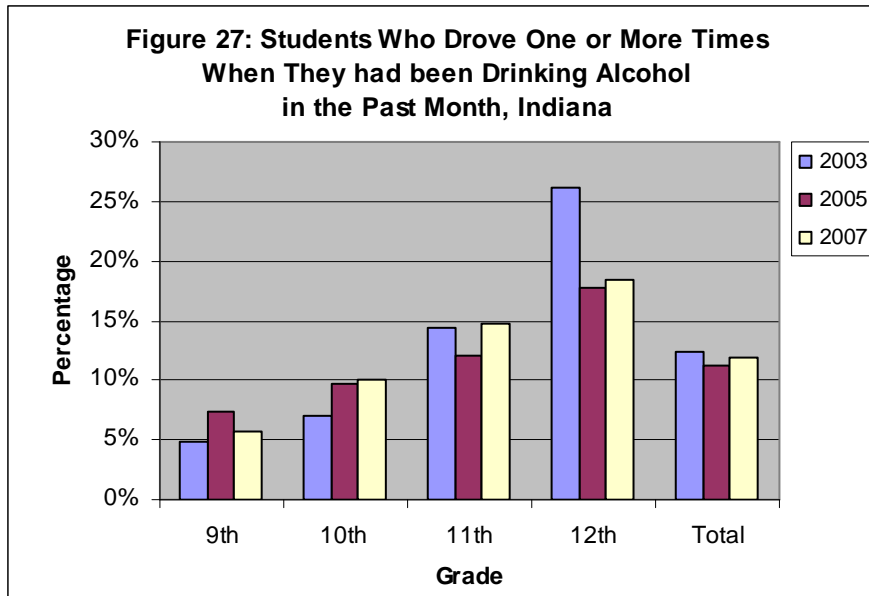
**Table 1: Persons Killed in Motor Vehicle Crashes by Highest Blood Alcohol Concentration (BAC), Indiana, 2003-2005**

	Total Fatalities	BAC = 0.00 No Alcohol Involved		BAC = 0.01-0.07		BAC = 0.08+	
		Number	Percent	Number	Percent	Number	Percent
2003	834	573	69	38	5	223	27
2004	947	643	68	47	5	257	27
2005	938	618	66	47	5	273	29

Source: Fatality Analysis Reporting System Data, 2003-2005



Source: Indiana State Department of Health, Youth Risk Behavior Survey Data, 2003, 2005, and 2007



Source: Indiana State Department of Health, Youth Risk Behavior Survey Data, 2003, 2005, and 2007

**Table 2: Restraint Use of Drivers Killed in Motor Vehicle Crashes, Indiana, 2003-2005**

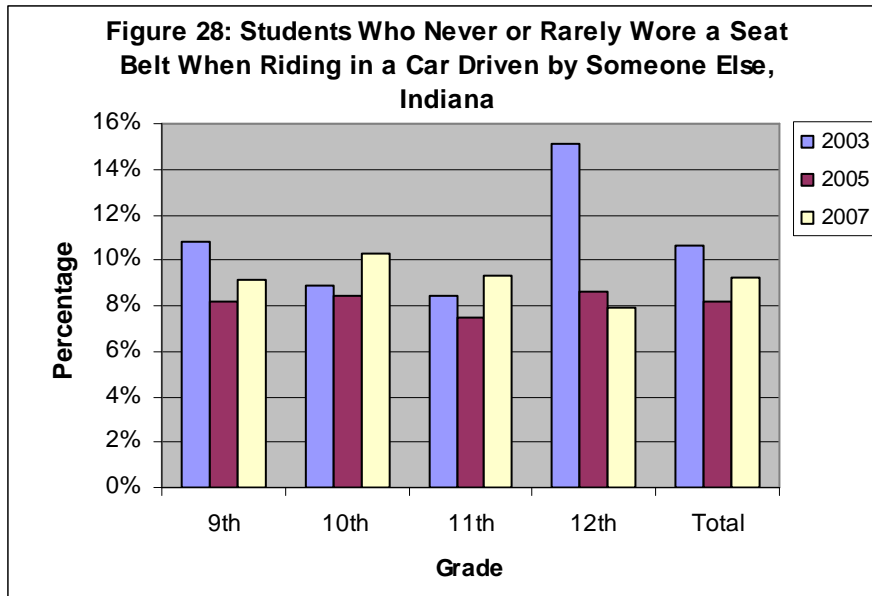
	Total Fatalities	Restraint Used		No Restraint Used		Restraint Use Unknown	
		Number	Percent	Number	Percent	Number	Percent
2003	961	572	60	286	30	103	11
2004	1047	611	58	321	31	115	11
2005	1034	589	57	325	31	120	12
Total	3042	1772	58	932	31	338	11

Source: Fatality Analysis Reporting System Data, 2003-2005

**Table 3: Restraint Use of Occupants Killed in Motor Vehicle Crashes, Indiana, 2003-2005**

	Total Fatalities	Restraint Use		No Restraint Use		Restraint Use Unknown	
		Number	Percent	Number	Percent	Number	Percent
2003	644	287	45	295	46	62	10
2004	712	290	41	324	46	98	14
2005	711	295	42	333	47	83	12
Total	2067	872	42	952	46	243	12

Source: Fatality Analysis Reporting System Data, 2003-2005



Source: Indiana State Department of Health, Youth Risk Behavior Survey Data, 2003, 2005, and 2007

## Conclusion

Injuries and deaths caused by MVCs remain a serious public health problem. Between 2003 and 2005, MVCs were the 9<sup>th</sup> leading cause of death for Indiana residents, claiming 2,881 lives with an age-adjusted rate of 15.4 per 100,000 population.<sup>(2)</sup> Based on hospital discharge data for the three year period, MVCs accounted for approximately 7.3% of all outpatient/ED visits and approximately 10.5% of all inpatient hospitalizations. The economic burden of motor vehicle crash injuries is also enormous. The total charges during 2003 to 2005 for inpatient hospitalizations and outpatient/ED visits was \$412 million.<sup>(3)</sup> The medical costs alone do not even account for lost productivity, property damage, higher insurance premiums, and other financial costs to individuals, their families, their communities, and society as a whole. Data show the need to direct prevention efforts to specific groups, such as older adults, teens, and children in order to reduce the burden on Indiana residents and the state's economy.

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